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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/688,882

10/21/2003

Hideki Yamada

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2771

23838

7590

06/22/2005

KENYON & KENYON

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WASHINGTON, DC 20005

EXAMINER

DRODGE, JOSEPH W

ART UNIT

PAPER NUMBER

1723

DATE MAILED: 06/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/688,882

Applicant(s)

YAMADA ET AL.

Examiner

Joseph W. Drodge

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2003.  
2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-21 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 17-21 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☒ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1003.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 17-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumano et al patent 5,783,079 in view of Marino et al patent 4,638,168, Taketani et al patent 4,260,652 and admissions of the Instant Specification on pages 13 and 14.

Kumano et al disclose a process of producing a polysulfone porous hollow fiber by a

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dry-set? (dry-wet) formation (column 6, lines 29-32 and 45-48), forming a thin separating layer by interfacial condensation including contacting the fiber membrane with solutions of amine and acid halide, respectively where the concentrations of the two solutions may vary but are held substantially constant by renewing the respective bath sources when necessary (column 7, lines 44-49 and column 8, lines 31-52 and column 12, lines 24-41).

The thickness of the separating layer is said to be optimized with respect to being thick enough to avoid defects while not being so thick as to deteriorate permability and to be a function of concentrations of the solutions and may vary widely depending upon selected concentrations (column 8, lines 31-52 and column 10, lines 31-46).

The claims differ in requiring the membranes to have a property such that, in the infrared absorption spectrum, the ratio of adsorption intensity of the polyamide layer to the polysulfone layer, at a specified absorption peak and wavenumber ranges between 0.1 and 1.5, have a sucrose removal of 92% or more, and have a water permeability of 0.2 m<sup>3</sup>/m<sup>2</sup>/day with respect to an aqueous sucrose solution at particular operating pressure, temperature and pH.

As to adsorption intensity ratios, the instant specification at pages 13-14 teach that such ratios inherently vary primarily as a result of thicknesses of the respective membrane layers, while Marino et al teach determination of hollow fiber, polyamide or polysulfone material, thicknesses by measured adsorption intensities in any wavelength of light, including infrared (column 2, lines 53-65) and Taketani et al teach to determine thicknesses of both a separating polyamine layer and substrate polysulfone layer of

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composite membranes with controlled layer thicknesses (column 25, lines 26-33 and column 28, lines 50-57, etc.) and in which the polymer concentrations and chemical makeup may be measured by infrared adsorption spectroscopy (column 29, lines 12-68).

It would have been obvious to one of ordinary skill in the art to have considered the Kumano et al membrane to inherently possess the claimed absorption intensity ratio, since Kumano et al teach to optimize membrane layer composition concentrations and thicknesses, the instant Specification teaches that layer thicknesses are the primary factor in giving adsorption intensity ratio values, and Marino et al and Taketani et al teach that membrane thicknesses and compositions are readily determinable by infrared adsorption spectrum analysis.

With respect to sucrose removal and attendant water permeability, Kumano et al disclose the membrane being used for separating dextrose or glucose from an aqueous solution and effectively removing dextrose while maintaining a high water permeability (Example 1 coupled with Table 1 on column 21). Thus, it would have been also obvious to one of ordinary skill in the art to have optimized the membrane of Kumano et al to be operative to remove the claimed percentage of sucrose from aqueous solution, since dextrose is chemically similar to dextrose and Kumano et al teach that separating layer concentrations and thicknesses can be widely varied for optimization.

With regard to claim 18, column 9, lines 1-7 of Kumano indicate sequential contact with the amine solution and acid halide solution.

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With regard to claim 19, Kumano discloses trifunctional acid halide at column 8, line 14.

With regard to claim 20, Kumano teaches piperazine compounds at column 8, lines 3-7.

With regard to claim 21, column 8, lines 36-40 of Kumano disclose approximately equal concentrations of piperazine type multifunctional halide and acid halide hence a ratio within the specified range.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Shiro et al patent 5,259,950 is of interest with respect to making a membrane of polysulfone support layer and polyamide separating layer by interfacial polymerization, the latter being cross-linked.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Drodge at telephone number 571-272-1140. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda Walker, can be reached at 571-272-1151. The fax phone number for the examining group where this application is assigned is 703-872-9306.

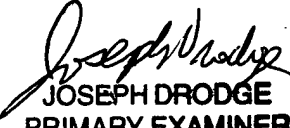
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PAIR, and through Private PAIR only for unpublished applications. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JWD

June 16, 2005

  
JOSEPH DRODGE  
PRIMARY EXAMINER